This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (PREVIOUSLY PRESENTED) A method for monitoring and optimizing fluid extraction from geological strata comprising:

coupling a flow transducer to a check valve operatively coupled to a discharge conduit associated with a pump,

wherein said flow transducer is adapted to generate flow signals by detecting movement of an element associated with said check valve,

electromagnetically coupling said flow transducer to a local processing system,

monitoring said flow signals at least during operation of said pump,

accumulating at least a portion of said flow signals in a memory associated with said local processing system, and

determining an optimum pumping cycle from said accumulated flow signals.

2. (PREVIOUSLY PRESENTED) The method according to claim 1 further including;

transferring at least a portion of said accumulated flow signals from said local processing system to another processing system, and

outputting said optimized pumping cycle in a format useful for optimizing fluid extraction from said geological strata using said pump.

3. (PREVIOUSLY PRESENTED) The method according to claim 1 further including;

electromagnetically coupling a motor controller associated with said pump to said local processing system,

generating a control signal if said flow signals fall outside a predetermined range or predetermined set point, and

sending said control signal to said motor controller;

wherein said motor controller changes an operating state of said pump upon receipt of said control signal.

4. (PREVIOUSLY PRESENTED) The method according to claim 2 further including storing at least a portion of said accumulated flow signals in a data store associated at least with said another processing system.

5. (PREVIOUSLY PRESENTED) The method according to claim 1 wherein said flow transducer generates said flow signals based at least in part on one of, variable reluctance effects, Hall effects, magnetic inductance effects, binary switch states, potentiometer outputs or piezoelectric effects.

6. (PREVIOUSLY PRESENTED) The method according to claim 2 wherein said transferring is accomplished using an electronic transport medium,

wherein said electronic transport medium comprises one of;

a telecommunications link, a laptop computer, a personal data assistant, or a data logging device.

7. (PREVIOUSLY PRESENTED) The method according to claim 3 wherein said operating state includes turning said pump on or off.

8. (ORIGINAL) The method according to claim 3 wherein said predetermined range includes low or loss of fluid flow.

9. (PREVIOUSLY PRESENTED) The method according to claim 3 wherein said predetermined set point includes a flow duration in which said pump has been operating or idle.

10. (PREVIOUSLY PRESENTED) The method according to claim 1 wherein said position detectable element of said check valve includes means for stimulating said flow transducer to generate said flow signals coincident with said movement.

11. (PREVIOUSLY PRESENTED) A method for monitoring and optimizing fluid extraction from geological strata comprising:

coupling a flow transducer to an inline check valve installed on a discharge conduit associated with a positive displacement pump,

wherein said flow transducer is adapted to generate flow signals by detecting movement of a position detectable element of said check valve,

electromagnetically coupling said flow transducer to a local supervisory control system,

monitoring said flow signals generated at least during operation of said positive displacement pump,

accumulating at least a portion of said flow signals in a memory associated with said local supervisory control system,

transferring at least a portion of said accumulated flow signals from said local supervisory control system over a network to a centralized supervisory control system,

determining an optimum pumping cycle from said accumulated flow signals, and outputting said optimized pumping cycle in a format useful for optimizing fluid extraction from said geological strata using said positive displacement pump.

12. (PREVIOUSLY PRESENTED) A system for monitoring and optimizing fluid extraction from geological strata comprising:

a flow transducer coupled to a check valve and adapted to generate flow signals by detection of flow induced movement of a position detectable element internal to said check valve,

wherein said check valve is operatively coupled to a discharge conduit associated with a positive displacement pump;

a local processing system electromagnetically coupled to said flow transducer including;

a first processor;

a first memory coupled to said first processor;

and at least one application operatively stored in at least a portion of said first memory having logical instructions executable by said first processor to at least;

monitor said flow signals generated by said flow transducer at least during operation of said positive displacement pump,

accumulate at least a portion of said flow signals in another portion of said first memory, and

transfer at least a portion of said accumulated flow signals to an electronic transport medium.

13. (PREVIOUSLY PRESENTED) The system according to claim 12 further comprising;

another processing system including:

a second processor;

a data store coupled to said second processor;

a second memory coupled to said second processor; and

at least another application operatively stored in at least a portion of said second memory having logical instructions executableby said second processor to at least;

receive said accumulated flow signals from said electronic transport medium,

retrievably store at least a portion of said accumulated flow signals in said data store,

output said accumulated flow signals in a format useful for optimizing fluid extraction from said geological strata using said positive displacement pump.

14. (PREVIOUSLY PRESENTED) The system according to claim 13 wherein said electronic transport medium includes one of; a telecommunications link, a laptop computer, a personal data assistant, or a data logging device.

15. (PREVIOUSLY PRESENTED) The system according to claim 12 wherein said flow transducer generates said flow signals based at least in part on one of;
variable reluctance effects, Hall effects, magnetic inductance effects, binary switch states, potentiometer outputs or piezoelectric effects.

16. (ORIGINAL) The system according to claim 12 wherein said at least one application further includes instructions executable by said fist processor for transmitting a control signal to an electromagnetically coupled motor controller associated with said positive displacement pump if said flow signals fall outside a predetermined range or predetermined set point.

17. (ORIGINAL) The system according to claim 16 wherein said control signal causes said motor controller to change an operating state of said positive displacement pump.

18. (ORIGINAL) The system according to claim 17 wherein said operating state includes turning said positive displacement pump on or off.

19. (ORIGINAL) The system according to claim 16 wherein said predetermined range includes low or loss of fluid flow.

20. (ORIGINAL) The system according to claim 16 wherein said predetermined set point includes a flow duration in which said positive displacement pump has been operating or idle.

21. (PREVIOUSLY PRESENTED) A system for monitoring and optimizing fluid extraction from geological strata comprising:

a flow transducer coupled to a check valve including means for generating flow signals by detecting flow induced movement of a position detectable element internal to said check valve;

a local processing system electromagnetically coupled to said flow transducer and including means for;

monitoring said flow signals generated at least during operation of a positive displacement pump inline with said check valve;

accumulating at least a portion of said flow signals in a memory associated with said local processing system;

transferring at least a portion of said accumulated flow signals to another processing system;

electromagnetically coupling a motor controller associated with said positive displacement pump to said local processing system;

generating a control signal if;

said flow signals fall outside a predetermined range,

or said flow signals fall outside a predetermined set point,

or a control command is received from said another processing system; and,

sending said control signal to said motor controller;

wherein said motor controller changes an operating state of said positive displacement pump upon receipt of said control signal.

22. (PREVIOUSLY PRESENTED) The system according to claim 21 wherein said another processing system is in processing communications over a network with at least said local processing system and includes means for;

receiving said accumulated flow signals from said network;

retrievably storing at least a portion of said accumulated flow signals in a data store;

determining an optimum pumping cycle from said accumulated flow signals;

generating said control command;

sending said control command to at least said local processing system; and

outputting said optimum pumping cycle in a format useful for optimizing fluid extraction from said geological strata using said positive displacement pump.

23. (PREVIOUSLY PRESENTED) The system according to claim 22 wherein said network is a wireless telecommunications network.

24. (PREVIOUSLY PRESENTED) The system according to claim 21 wherein said position detectable element includes at least one permanent magnet attached thereto and configured to stimulate said flow transducer to generate said flow signals coincident with flow induced movement of said position detectable element.

25. (PREVIOUSLY PRESENTED) The system according to claim 21 wherein said motor controller further includes timer means for turning said positive displacement pump on or off in accordance with a programmed pumping cycle.

26. (PREVIOUSLY PRESENTED) The system according to claim 25 wherein said optimum pumping cycle is used to at least modify said programmed pumping cycle.

27. (ORIGINAL) The system according to claim 25 wherein said programmed pumping cycle is modified manually by an operator.

28. (PREVIOUSLY PRESENTED) The system according to claim 25 wherein said programmed pumping cycle is modified automatically by either said local processing system or said another processing system.

29. (PREVIOUSLY PRESENTED) The system according to claim 22 wherein said another processing system further includes means for heuristically determining said optimum pumping cycle.

30. (PREVIOUSLY PRESENTED) The system according to claim 21 where said transferring occurs automatically based at least in part on one of; time, in response to a transfer request or in response to an event.

31. (PREVIOUSLY PRESENTED) The system according to claim 21 wherein said control command is generated based at least in part on one of: time or in response to an event.

32. (CURRENTLY AMENDED) A computer program product embodied in a tangible form readable by a processor having executable instructions stored thereon for causing said processor to:

monitor flow signals generated by an above ground flow transducer;

accumulate at least a portion of said flow signals in a memory coupled to said processor,

transmit a control signal to an electromagnetically coupled motor controller if said flow signals fall outside a predetermined range or predetermined set point;

transfer at least a portion of said accumulated flow signals to another processor, and

output said accumulated flow signals in a format useful for optimizing fluid extraction from geological strata using a pump.

33. (ORIGINAL) The computer program product according to claim 32 wherein said tangible form comprises magnetic media, optical media or logical media.

34. (ORIGINAL) The computer program product according to claim 32 wherein said executable instructions are stored in a code format comprising byte code, compiled, interpreted, compliable and interpretable.

35. (PREVIOUSLY PRESENTED) A method for monitoring and optimizing fluid extraction from geological strata comprising:

coupling a flow transducer to a flap valve operatively coupled to a discharge conduit associated with a positive displacement pump,

wherein said flow transducer is adapted to generate flow signals by detecting movement of a position detectable flap element internal to said flap valve,

electromagnetically coupling said flow transducer to a local supervisory control system,

monitoring said flow signals at least during operation of said positive displacement pump,

accumulating at least a portion of said flow signals in a memory associated with said local supervisory control system, and

determining an optimum pumping cycle from said accumulated flow signals.

36. (PREVIOUSLY PRESENTED) The method according to claim 35 further including;

transferring at least a portion of said accumulated flow signals from said local supervisory control system to a centralized supervisory control processing system,

and outputting said optimum pumping cycle in a format useful for optimizing fluid extraction from said geological strata using said positive displacement pump.

37. (PREVIOUSLY PRESENTED) A system for monitoring and optimizing fluid extraction from geological strata comprising:

a flow transducer coupled to a flap valve wherein said flap valve includes a magnetic element disposed on a moveable flap which generates flow signals detectable by said flow transducer as a function of fluid flow through said flap valve;

a local supervisory control system electromagnetically coupled to said flow transducer and including means for;

monitoring said flow signals generated at least during operation of a positive displacement pump inline with said flap valve;

accumulating at least a portion of said flow signals in a memory associated with said local supervisory control system;

transferring at least a portion of said accumulated flow signals over a network to a centralized supervisory control system;

electromagnetically coupling a motor controller associated with said positive displacement pump to said local supervisory control system;

generating a control signal if one or more of the following conditions are detected;

said flow signals fall outside a predetermined range, or

said flow signals fall outside a predetermined set point, or

a control command is received from said centralized supervisory control system;

sending said control signal to said motor controller;

wherein said motor controller changes an operating state of said positive displacement pump upon receipt of said control signal.

38. (PREVIOUSLY PRESENTED) The system according to claim 37 wherein said centralized supervisory control system is in processing communications over said network with at least said local supervisory control system and includes means for;

receiving said accumulated flow signals from said network;

retrievably storing at least a portion of said accumulated flow signals in a data store;

determining an optimum pumping cycle from said accumulated flow signals;

generating said control command;

sending said control command to at least said local supervisory control system; and

outputting said optimum pumping cycle in a format useful for optimizing fluid extraction from said geological strata using said positive displacement pump.